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60/208,452 31 May 2000 (31.05.2000) US</p> <p>(71) Applicant (for all designated States except US): SANDIA CORPORATION [US/US]; P.O. Box 5800, Mail Stop 0161, Albuquerque, NM 87185-0161 (US).</p> <p>(72) Inventors; and</p> <p>(75) Inventors/Applicants (for US only): CHOQUETTE, Kent, D. [US/US]; 407 Beringer Circle, Urbana, IL 61801 (US). KLEM, John, F. [US/US]; 4705 Glenwood Hills Drive, Albuquerque, NM 87111 (US).</p> | <p>(74) Agent: NICHOLS, Peter, A.; Christie, Parker & Hale LLP, Suite 500, 350 West Colorado Boulevard, Pasadena, CA 91105 (US).</p> <p>(81) Designated States (national): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GI, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW.</p> <p>(84) Designated States (regional): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).</p> <p>Published:
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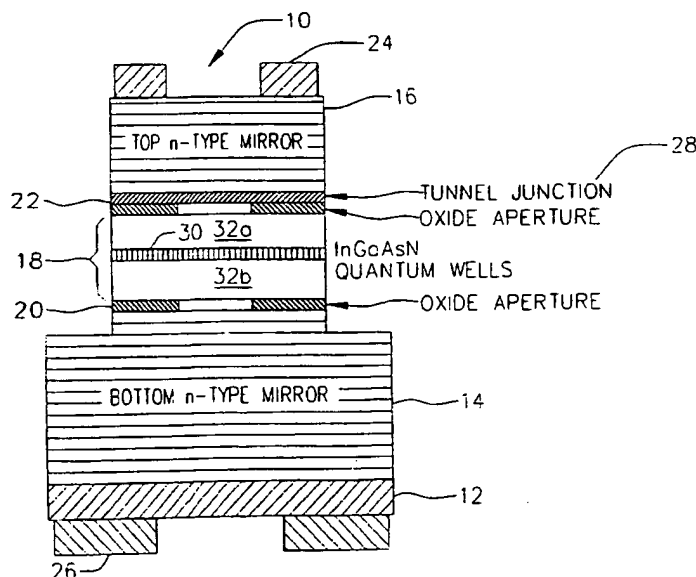
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(54) Title: LONG WAVELENGTH VERTICAL CAVITY SURFACE EMITTING LASER



(57) Abstract: Selectively oxidized vertical cavity lasers emitting near 1300 nm using InGaAsN quantum wells are reported for the first time which operate continuous wave below, at and above room temperature. The lasers employ two n-type $\text{Al}_{0.94}\text{Ga}_{0.06}\text{As}/\text{GaAs}$ distributed Bragg reflectors each with a selectively oxidized current aperture adjacent to the active region, and the top output mirror contains a tunnel junction to inject holes into the active region. Continuous wave single mode lasing is observed up to 55 °C.

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INTERNATIONAL SEARCH REPORT

International Application No

PCT/US 01/17548

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 H01S5/183

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 H01S

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, INSPEC

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 0 822 630 A (HEWLETT PACKARD CO) 4 February 1998 (1998-02-04)	1-3, 9-13, 19-23
Y	abstract; claims 1,2; figure 1 column 7, line 54 -column 8, line 17	1-6, 9-17, 19-23
Y	WO 98 07218 A (GORE & ASS) 19 February 1998 (1998-02-19) page 8, line 12; figure 2 -/--	1-6, 9-17, 19-23

☒ Further documents are listed in the continuation of box C.☒ Patent family members are listed in annex.

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X document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

Y document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

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Date of the actual completion of the international search

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INTERNATIONAL SEARCH REPORT

Information on patent family members

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